

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

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Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection

API 47 - 051 - 02266 County Marshall District Mead
Quad Glen Easton 7.5' Pad Name Keith Stern Field/Pool Name _____
Farm name TH Exploration, LLC Well Number Keith Stern S-17HU
Operator (as registered with the OOG) Tug Hill Operating, LLC
Address 380 Southpointe Boulevard, Plaza II, Suite 200 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,402,804.81 Easting 526,366.85
Landing Point of Curve Northing 4,402,170.8 Easting 526,297.4
Bottom Hole Northing 4,400,316.4 Easting 527,340.7

Elevation (ft) 744.65' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
SOBM; Base oil, osmotic inhibitor, weighting agent, viscosifier, emulsifier, hardness buffer, fluid loss additive, LCM, Shale inhibitor, de-foamer, soaping agent, coagulant, flocculant; specific additives per WSSP and Permit.

Date permit issued 2/5/2020 Date drilling commenced conductor: 4/19/2020, big rig: 7/26/2020 Date drilling ceased 8/29/2020
Date completion activities began 8/2/2021 Date completion activities ceased 8/16/2021
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 439' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 932' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 340-346', 433-439' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED
Reviewed by:
SB
10/21/2022
Shub...

API 47-051 - 02266 Farm name TH Exploration, LLC Well number Keith Stern S-17HU

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36"	30"	120'	NEW	94.5#	N/A	Y
Surface	26"	20"	514'	NEW	106.5#	N/A	Y
Coal							
Intermediate 1	17 1/2"	13 3/8"	2,244'	NEW	54.5#	N/A	Y
Intermediate 2	12 1/4"	9 5/8"	10,167'	NEW	47#	N/A	Y
Intermediate 3							
Production	8 1/2"	5 1/2"	18,871'	NEW	23#	N/A	Y
Tubing		2 7/8"	9,436'	NEW	4.7#	N/A	Y
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A	309	15.6	1.2	365	0	8
Surface	A	995	15.6	1.2	1,194	0	8
Coal							
Intermediate 1	A	1831	14.5	1.16	2,124	0	8
Intermediate 2	A	4560	14.5	1.16	5,290	0	8
Intermediate 3							
Production	A	4565	16.5	1.03	4,702	0	8
Tubing							

Drillers TD (ft) 18,912'

Loggers TD (ft) n/a

Deepest formation penetrated Trenton

Plug back to (ft) n/a

Plug back procedure n/a

Kick off depth (ft) 10,403'

Check all wireline logs run
 caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING 3 centralizers on surface casing at equal distance.

Intermediate - 1 centralizer every other joint.

Production - one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/2/2021
Job End Date:	8/16/2021
State:	West Virginia
County:	Marshall
API Number:	47-051-02266-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Keith Sterns S 17HU
Latitude:	39.77477099
Longitude:	-80.69211834
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	11,346
Total Base Water Volume (gal):	12,826,422
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Tug Hill Operating	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.06062	None
Sand (40/70 White Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	10.61131	None
Sand (100 Mesh Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	2.94046	None
Hydrochloric Acid (7.5%)	CNR	Acidizing	Water	7732-18-5	85.00000	0.21975	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.09566	None
StimStream FR 9800	Chemstream	Friction Reducer	Alkanes, C16-20-iso-	90622-59-6	25.00000	0.02066	None
			Butene, homopolymer	9003-29-6	25.00000	0.02066	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00248	None
MC MX 9-4743	Multi-Chem	Biocide	Sodium Nitrate	7631-99-4	60.00000	0.02189	None
LD-7750W	Multi-Chem	Scale Inhibitor					

			Methanol	67-56-1	60.00000	0.00493	None
			Phosphonic Acid Salt	Proprietary	5.00000	0.00041	None
ProHib 100	CNR	Acid Inhibitor					
			2-Butoxyethanol	111-76-2	60.00000	0.00048	None
			Proprietary material	Proprietary	30.00000	0.00024	None
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00016	None
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	None
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	None
ProFE 105	CNR	Iron Control					
			Citric Acid	77-92-9	20.00000	0.00019	None
			Acetic Acid	64-19-7	5.00000	0.00005	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	85.00000	0.21975	
			Butene, homopolymer	9003-29-6	25.00000	0.02066	
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00248	
			Phosphonic Acid Salt	Proprietary	5.00000	0.00041	
			Proprietary material	Proprietary	30.00000	0.00024	
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00016	
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	
			Acetic Acid	64-19-7	5.00000	0.00005	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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**KEITH STERN S-17HU
PEFORATION RECORD**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	8/2/2021	18,694	18,741	12	Utica
2	8/2/2021	18,467	18,643	48	Utica
3	8/3/2021	18,267	18,443	48	Utica
4	8/3/2021	18,067	18,243	48	Utica
5	8/3/2021	17,867	18,043	48	Utica
6	8/4/2021	17,667	17,843	48	Utica
7	8/4/2021	17,467	17,643	48	Utica
8	8/4/2021	17,267	17,443	48	Utica
9	8/5/2021	17,067	17,243	48	Utica
10	8/5/2021	16,867	17,043	48	Utica
11	8/6/2021	16,667	16,843	48	Utica
12	8/6/2021	16,467	16,643	48	Utica
13	8/6/2021	16,267	16,443	48	Utica
14	8/8/2021	16,067	16,243	48	Utica
15	8/9/2021	15,867	16,043	48	Utica
16	8/9/2021	15,667	15,843	48	Utica
17	8/9/2021	15,467	15,643	48	Utica
18	8/10/2021	15,267	15,443	48	Utica
19	8/10/2021	15,067	15,243	48	Utica
20	8/11/2021	14,867	15,043	48	Utica
21	8/11/2021	14,667	14,843	48	Utica
22	8/12/2021	14,467	14,643	48	Utica
23	8/12/2021	14,267	14,443	48	Utica
24	8/12/2021	14,067	14,243	48	Utica
25	8/13/2021	13,867	14,043	48	Utica
26	8/13/2021	13,667	13,843	48	Utica
27	8/13/2021	13,467	13,643	48	Utica
28	8/14/2021	13,267	13,443	48	Utica
29	8/14/2021	13,067	13,243	48	Utica
30	8/14/2021	12,867	13,043	48	Utica
31	8/14/2021	12,667	12,843	48	Utica
32	8/15/2021	12,467	12,643	48	Utica
33	8/15/2021	12,267	12,443	48	Utica
34	8/15/2021	12,067	12,243	48	Utica
35	8/16/2021	11,867	12,042	48	Utica

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KEITH STERN S-17HU

STIMULATION INFORMATION PER STAGE

Stage No.	Ave. Pump Rate (BPM)	Max. Department of Environmental Protection Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	77.00	11457	10875	7185	246560	7,004	0
2	88.00	11661	10387	7688	501300	9,207	0
3	89.00	11378	9489	7729	496460	8,933	0
4	89.00	11135	9696	8172	500900	9,008	0
5	89.00	11131	9645	8207	505120	9,231	0
6	90.00	11211	9930	8924	495570	8,912	0
7	90.00	11190	9923	8142	497620	9,048	0
8	81.00	10625	9289	8223	500700	9,040	0
9	90.00	10945	9237	8735	498990	8,961	0
10	90.00	11035	9492	7701	507220	8,978	0
11	23.00	9233	6336	8218	509980	9,051	0
12	90.00	11181	9007	8633	500540	10,265	0
13	88.00	11156	9271	7857	502080	10,560	0
14	88.00	11127	9308	8568	509060	9,739	0
15	90.00	11078	9724	8710	509780	9,067	0
16	90.00	11017	9385	8270	509720	9,034	0
17	89.00	10781	9523	8778	506880	9,026	0
18	89.00	10827	9266	8934	490260	8,811	0
19	90.00	11080	9433	8652	509580	9,079	0
20	90.00	11082	9523	8150	508640	8,933	0
21	90.00	10886	9115	8665	506040	8,940	0
22	90.00	11070	9856	8314	506140	8,821	0
23	90.00	11003	9240	8170	504320	8,971	0
24	89.00	11148	9804	7492	500600	8,809	0
25	90.00	11037	9805	7568	507900	8,860	0
26	90.00	11094	8994	7925	501420	8,953	0
27	89.00	10850	10088	7999	504700	8,853	0
28	88.00	10776	10261	8118	503560	8,791	0
29	89.00	10872	10625	8573	496540	8,757	0
30	90.00	10602	9435	8605	507540	8,756	0
31	89.00	10435	9747	8412	509420	8,758	0
32	90.00	10615	9319	8378	497420	8,753	0

10/21/2022

Stage No.	Ave. Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	SIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
33	87.00	10510	10518	7945	500360	8,735	0
34	88.00	10330	9973	8472	501870	8,747	0
35	90.00	10311	9194	8190	502420	8,760	0

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KEITH STERN S-17HU

LITHOLOGY INFORMATION

LITHOLOGY/FORMATION	TOP DEPTH IN FT/ Name TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID
Maxton	1503	1647	1503	1647	Sandstone
Big Lime	1647	1701	1647	1701	Limestone
Big Injun	1701	1960	1701	1961	Sandstone
Weir	1960	2152	1961	2153	Sandstone
Berea	2152	2417	2153	2419	Sandstone
Gordon	2417	2512	2419	2514	Sandstone
Fifty Foot	2512	3148	2514	3152	Sandstone
Speechley	3148	4597	3152	4604	Sandstone
Benson	4597	4990	4604	4998	Sandstone
Alexander	4990	5628	4998	5637	Siltstone
Rhinestreet	5628	6068	5637	6078	Black Shale
Middlesex	6068	6142	6078	6152	Black Shale
Geneseo/Burkett	6142	6173	6152	6184	Black Shale
Tully	6173	6208	6184	6219	Limestone
Hamilton	6208	6321	6219	6330	Gray Shale
Marcellus	6321	6381	6330	6391	Black Shale
Onondaga	6381	6581	6391	6592	Limestone
Oriskany	6581	6691	6592	6705	Sandstone
Helderberg	6691	7058	6705	7083	Limestone
Salina	7058	8114	7083	8177	Salt/Anhydrite/LS
Lockport	8114	8479	8177	8554	Dolomite
Rose Hill	8479	8765	8554	8850	Shale
Packer Shell	8765	8981	8850	9074	Limestone
Clinton/Tuscarora	8981	9089	9074	9186	Sandstone
Juniata/Queenston	9089	9908	9186	10033	Red Shale
Reedsville	9908	10945	10033	11164	Gray Shale
Utica	10945	11219	11164	-	Black Shale
Point Pleasant	11219	-	11663	-	Shale/Limestone

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NY Department of
Environmental Protection

10/21/2022

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	8/2/2021
Job End Date	8/16/2021
State	West Virginia
County	Marshall
API Number	47-051-02266-00-00
Operator Name	Tug Hill Operating, LLC
Well Name and Number	Keith Sterns S 17HU
Latitude	39.77477099
Longitude	-80.69211834
Datum	NAD27
Federal Well	NO
Indian Well	NO
True Vertical Depth	11,346
Total Base Water Volume (gal)	12,826,422
Total Base Non Water Volume	0

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Hydraulic Fracturing Fluid Composition:

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Water	Tug Hill Operating	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.06062	None
Sand (40/70 White Proppant)	ProFrac	Proppant					
Sand (100 Mesh Proppant)	ProFrac	Proppant	Silica Substrate	14808-60-7	100.00000	10.61131	None
Hydrochloric Acid (7.5%)	CNR	Acidizing	Silica Substrate	14808-60-7	100.00000	2.94046	None
StimStream FR 9800	Chemstream	Friction Reducer	Water	7732-18-5	85.00000	0.21975	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.09566	None
			Alkanes, C16-20-iso-	90622-59-6	25.00000	0.02066	None
			Butene, homopolymer	9003-29-6	25.00000	0.02066	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00248	None
MC MX 9-4743	Multi-Chem	Biocide					
LD-7750W	Multi-Chem	Scale Inhibitor	Sodium Nitrate	7631-99-4	60.00000	0.02188	None

10/21/2022

ProHib 100	CNR	Acid Inhibitor	Methanol Phosphonic Acid Salt	67-56-1 Proprietary	60.00000 5.00000	0.00493 0.00041	None None
			2-Butoxyethanol	111-76-2	60.00000	0.00048	None
			Proprietary material	Proprietary	30.00000	0.00024	None
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00018	None
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	None
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	None
ProFE 105	CNR	Iron Control	Citric Acid Acetic Acid	77-92-9 64-19-7	20.00000 5.00000	0.00019 0.00005	None None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s) Listed Above							
			See Trade Name(s) List				
			Water	7732-18-5	85.00000	0.21975	
			Butene, homopolymer	9003-29-6	25.00000	0.02066	
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			Phosphonic Acid Salt	Proprietary	5.00000	0.00041	
			Proprietary material	Proprietary	30.00000	0.00024	
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00016	
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	
			Acetic Acid	64-19-7	5.00000	0.00005	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

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**KEITH STERN S LEASE
UTICA UNIT - 278.07 AC±
WELL 17HU
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°47'30"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 466,534.10	E. 1,633,446.38
NAD'83 GEO.	LAT-(N) 39.774477	LONG-(W) 80.692118
NAD'83 UTM (M)	N. 4,402,804.81	E. 526,366.85
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 464,678.2	E. 1,633,067.9
NAD'83 GEO.	LAT-(N) 39.769663	LONG-(W) 80.693377
NAD'83 UTM (M)	N. 4,402,237.5	E. 526,261.0
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 458,315.4	E. 1,636,490.3
NAD'83 GEO.	LAT-(N) 39.752320	LONG-(W) 80.680905
NAD'83 UTM (M)	N. 4,400,316.4	E. 527,336.0

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-14-20.1	WILLIAM K. STERN, ET UX	1.321
9-14-20.2	WILLIAM K. STERN, ET UX	1.525
9-14-20.3	WILLIAM K. STERN, ET UX	0.831



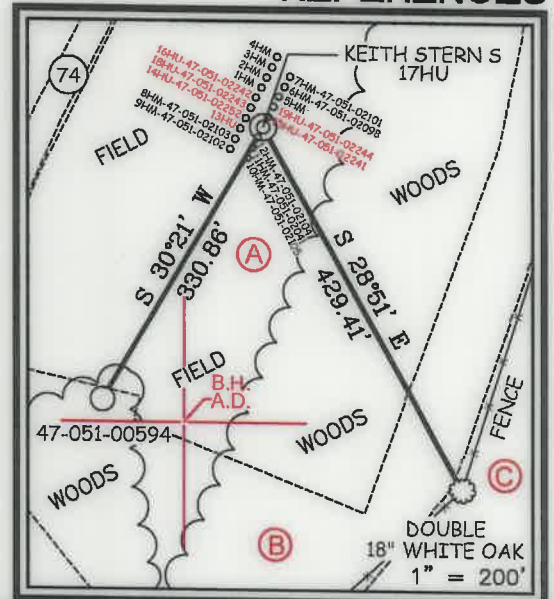
NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS > 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=200'
- PROPOSED LATERAL OR TOP HOLE OF KEITH STERN S-17HU IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OF PROPOSED KEITH STERN N-13HU, KEITH STERN N-14HU (47-051-02252), KEITH STERN N-15HU (47-051-02241), KEITH STERN N-16HU (47-051-02242), KEITH STERN S-18HU (47-051-02243), KEITH STERN S-19HU (47-051-02244), PROPOSED KNOB CREEK N-13HU, PROPOSED KNOB CREEK S-15HU, PROPOSED KNOB CREEK S-16HU.
- AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
- PLAT UPDATED TO SHOW AS-DRILLED PATH.

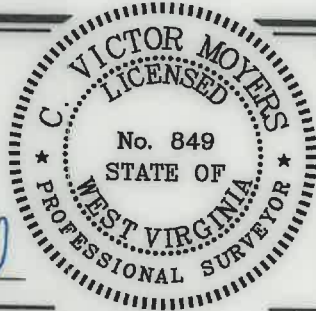
AS DRILLED COORDINATES FOR WELL NO. 17HU

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 466,534.10	E. 1,633,446.38
NAD'83 GEO.	LAT-(N) 39.774477	LONG-(W) 80.692118
NAD'83 UTM (M)	N. 4,402,804.81	E. 526,366.85
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 464,457.5	E. 1,633,183.8
NAD'83 GEO.	LAT-(N) 39.769061	LONG-(W) 80.692955
NAD'83 UTM (M)	N. 4,402,170.8	E. 526,297.4
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 458,315.0	E. 1,636,505.7
NAD'83 GEO.	LAT-(N) 39.752320	LONG-(W) 80.680850
NAD'83 UTM (M)	N. 4,400,316.4	E. 527,340.7

REFERENCES



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.258.5295
sllsv.com



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849 *C. Victor Moyers*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE MARCH 18, 20 21
REVISED _____
OPERATORS WELL NO. KEITH STERN S-17HU
API WELL NO. 47 - 051 - 02266
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8811P17HUAD.dwg
KEITH STERN S-17HU-REV1
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

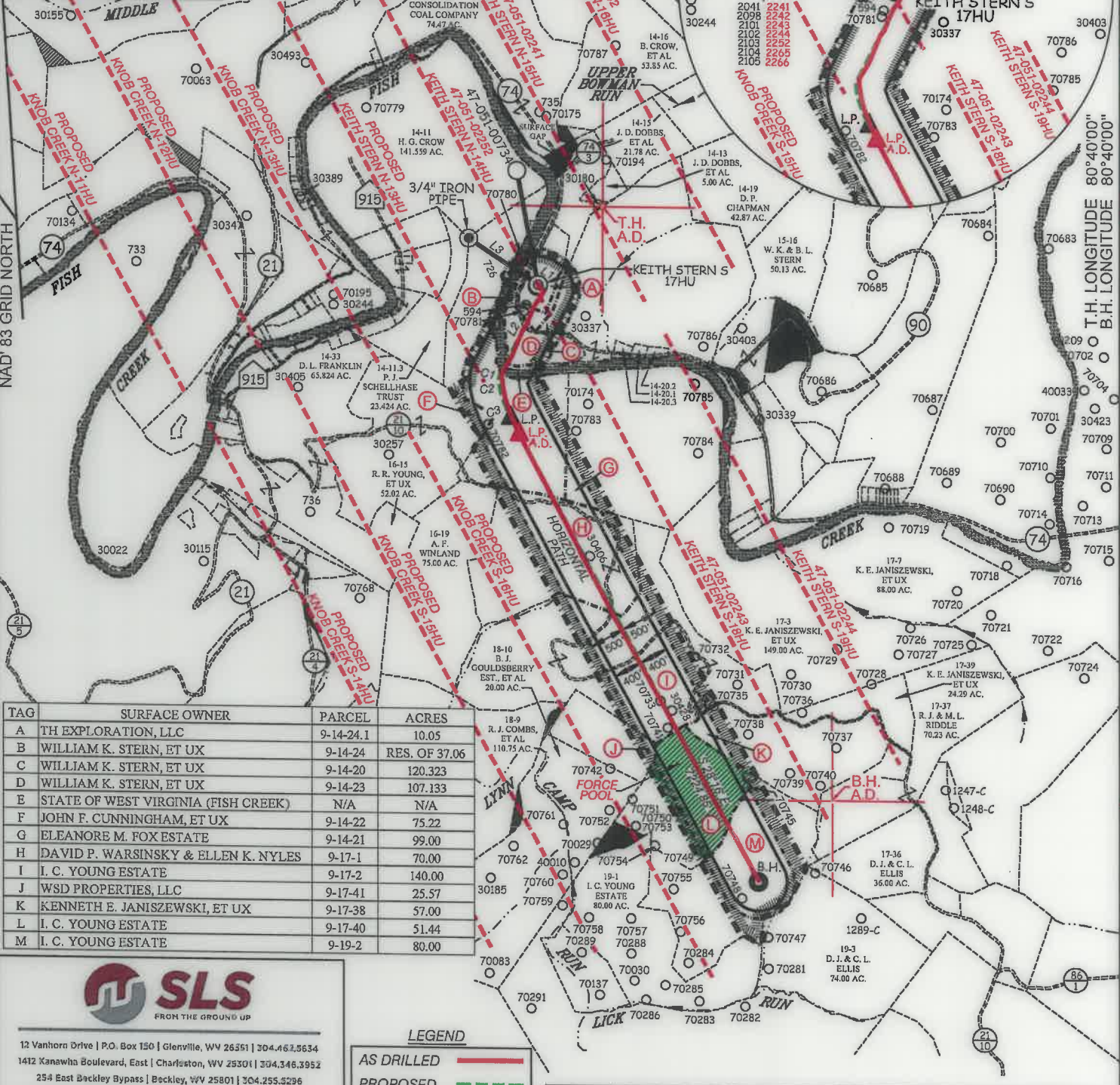
WELL TYPE: OIL _____ GAS X INJECTION _____ WASTE DISPOSAL _____ IF "GAS" PRODUCTION X STORAGE _____ DEEP X SHALLOW _____
LOCATION: GROUND = 1,342.20' ELEVATION PROPOSED = 1,326.35' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'
SURFACE OWNER TH EXPLORATION, LLC ACREAGE 10.05±
ROYALTY OWNER ISAAC CROW, ET AL - SEE WW-6A1 ACREAGE 10.05±
PROPOSED WORK: DRILL X CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____ OTHER _____
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD: 11,376' / TMD: 18,954'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS CT CORPORATION SYSTEM
FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

6.155' T.H. A.D.
14,333' B.H. A.D.

**KEITH STERN S LEASE
UTICA UNIT - 278.07 AC ±
WELL 17HU
TUG HILL OPERATING**

LINE	BEARING	DISTANCE
L1	S 59°02' E	95.92'
L2	S 26°58' W	1357.28'
L3	N 10°40' W	1593.18'
L4	N 56°34' W	1152.58'



TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION, LLC	9-14-24.1	10.05
B	WILLIAM K. STERN, ET UX	9-14-24	RES. OF 37.06
C	WILLIAM K. STERN, ET UX	9-14-20	120.323
D	WILLIAM K. STERN, ET UX	9-14-23	107.133
E	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
F	JOHN F. CUNNINGHAM, ET UX	9-14-22	75.22
G	ELEANORE M. FOX ESTATE	9-14-21	99.00
H	DAVID P. WARSINSKY & ELLEN K. NYLES	9-17-1	70.00
I	I. C. YOUNG ESTATE	9-17-2	140.00
J	WSD PROPERTIES, LLC	9-17-41	25.57
K	KENNETH E. JANISZEWSKI, ET UX	9-17-38	57.00
L	I. C. YOUNG ESTATE	9-17-40	51.44
M	I. C. YOUNG ESTATE	9-19-2	80.00

SLS
FROM THE GROUND UP

12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slsvv.com

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CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	80.68'	192.66'	S 10°40' W	80.09'
C2	157.53'	688.95'	S 08°12' E	157.18'
C3	392.10'	1662.50'	S 22°05' E	391.19'

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 466,534.10	E. 1,633,446.38
NAD'83 GEO.	LAT-(N) 39.774477	LONG-(W) 80.692118
NAD'83 UTM (M)	N. 4,402,804.81	E. 526,366.85

LANDING POINT

NAD'83 S.P.C.(FT)	N. 464,678.2	E. 1,633,067.9
NAD'83 GEO.	LAT-(N) 39.769663	LONG-(W) 80.693377
NAD'83 UTM (M)	N. 4,402,237.5	E. 526,261.0

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N. 458,315.4	E. 1,636,490.3
NAD'83 GEO.	LAT-(N) 39.752320	LONG-(W) 80.680905
NAD'83 UTM (M)	N. 4,400,316.4	E. 527,336.0



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

- UNIT BOUNDARY
- LEASED TRACTS INSIDE UNIT BOUNDARY
- SURFACE LINE
- PROPOSED UTICA
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE ADDITIONAL SHEETS)

SCALE 1" = 2000' FILE NO. 8811P17HUAD.dwg
KEITH STERN S-17HU-REV1

DATE MARCH 18, 20 21

REVISED

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STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL OPERATOR TUG HILL OPERATING, LLC ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

6,155' T.H.A.D. 14,333' B.H.A.D. COUNTY NAME PERMIT

**KEITH STERN S LEASE
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slswv.com

NO.	Lease ID	Tag	Parcel	Grantor, Lessor, Etc.	Deed Book/Page	
1	10*15605	A	9-14-24.1	ISAAC CROW ET UX	74	394
2	10*15605	B	9-14-24	ISAAC CROW ET UX	74	394
3	10*15509	C	9-14-20	WILLIAM K STERN AND BETTY L STERN	718	320
4	10*15812	D	9-14-23	WILLIAM K STERN AND BETTY L STERN, ET AL	687	220
5	10*23458	E	WV - FISH CREEK	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	1019	373
6	10*16479	F	9-14-22	JOHN F CUNNINGHAM AND BERNEICE K CUNNINGHAM	826	88
7	10*47051.243.1	G	9-14-21	MARY A FOX, ET AL	879	332
8	10*17135	H	9-17-1	ELLEN K NYLES, ET AL	919	625
9	10*15910	I	9-17-2	SHIRLEY KOONTZ, ET AL	701	303
10	TH #27877	J	9-17-41	JOHN T. GALLAHER AND EMILY J. GALLAHER	1065	480
11	10*47051.185.1	K	9-17-38	HOMER L SIMMONS AND GLADYS R SIMMONS, ET AL	885	68
12	10*23194	L	9-17-40	*FORCE POOL* ALBERT AND CHRISTOPHER HARTLEY	60	160
13	10*18610	M	9-19-2	NEIL ROBERT YOUNG, ET AL	934	636

RECEIVED
Office of Oil and Gas
SEP 30 2022
WV Department of
Environmental Protection

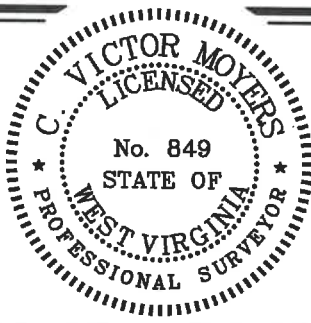
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10/21/2022

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